Para 9

G. R. S. 58]

Previous references. 1924-5

Ft 155-22 (1-4) (Ft)

File No. 19-24

Serial Nos. 1-2

Later references.

Preserve

GENERAL AND REVENUE SECRETARIAT

Serial Nos. 2

Part B for sept 24

SUBJECT

Working plan report of the sandal areas in the Chamarajanagar taluk

Je 1633-48 5.9.24

To Conservator of Forests
Superintendent of Govt Prg

Approved

252 (1)

G. R. S. III—11 1924

GENERAL AND REVENUE SECRETARIAT.

~~Pl~~

NOTES.

File No. 49/24

FILE HEADING.

Working plan report of the Sandal areas in the Chamarajanagar Malgar Taluk.

From The Conservator of Forests

No. 35 Dated 15.7.24 Received 16-7-24

Diary No. 952 Enclos. 1 Spare Copies.— Serial No. 1

BRIEF ABSTRACT OF LETTER.

Forwards the working plan report for sandalwood trees in the Chamarajanagar Malgar Taluk. prepared by Mr. D. Nanjundaswamy Rao, Sub Asst. Conservator & requests sanction thereto.

D. This letter has been separately called for on 5-7-24 Flag 7

NOTES AND ORDERS.

Submit for orders with the file approving the working plan for Hunsur Taluk.

25.7.24. {Pl 155-22(1-4)}.

Please compare draft

SWR 26/7

Draft Submitted

26/7

NOTES—First Sheet.

WD 1681—GPB—30,000—1s8-21

G. R. S. III-2]

WD 2810—GPB—10,000—31-5-24

General and Revenue Secretariat. | File No. 19 of 19 24.

Serial No.

4 Forwarded for
A ref enquiry is put up—
the separate figures of
Rev & Expre under the proposed
working plan. It is not known
what the expenditure of Rev
are at present. The
Conservator does not refer to the
question of "Reserve". The
D. F. O does not seem to see
in favour fit justify from
his marginal remarks.

SMR

Rev Secy 4/8

5 The working plan may be
returned & the Rev authorised to
direct the required no of trees -
of 100 kinds of which and
is available, it is necessary that
all dead and stunted be removed
& the rest allowed to grow. If this is
not done, the end is sure to
be damaged under the adjacent
Dr timber —

Secy 18/8.

SMR 19/8

420 19-8

I agree

25/8

Secy 18/8

SMR 28/8

NOTE—Contn. sheet.

G. R. D. 111-21

General and Revenue Secretariat. | File No. 19 of 1924

Serial No.	
1	Draft. Submd dtd. 26.8.24. Draft Rev Secy 31-8 Issue sm 1/9
2	To The Comm. of Inc Supdt. Coverplg. with 4 Reports WDC 1633-4 of 579. & appendices. Approves, with certain observations the working plan Reports & requests the Supdt. Govt. Plg. to get 62 copies of the Reports printed & to supply 50 copies to the Comm. & 12 to G.I.R.S. Invitee copies Rec'd on 2/12/24 may be Recorded. 10 copies sent to Records 5.12.24

GEN. & REV. SECRETT.
25 OCT 1924
INDUSTRIES & COMMERCE BRANCH.

GEN. & REV. SECRETT.
1-DEC 1924
INDUSTRIES & COMMERCE BRANCH.

NOTE—Contn. sheet.

OFFICE OF THE CONSERVATOR OF FORESTS IN MYSORE.

Tel. Address.
"Forestcon"

Dated Bangalore, 15th July 1924

No. 35

FROM

B. V. RAMAIENGAR, ESQ., B.A.,
Conservator of Forests in Mysore.

To

K.V.Anantharaman, Esquire, B.A.,
Secretary to the Government of Mysore,
Revenue Department, Bangalore.

SIR,

I have the honour to submit herewith, the sandal Working Plan Report of the Chamarajanagar Taluk together with a sketch map, drawn up by Mr. D.Narasimhamurti Rao, B.A., Sub Assistant Conservator of Forests, in charge of Sandal Survey Operations, Mysore Section, together with a copy of the Mysore District Forest Officer's letter No.992 dated the 12th June 1924 from the District Forest Officer, Mysore, offering his remarks thereon.

2. As regards the observation of the District Forest Officer in para 2 of his letter viz., if exploitation accord-ing to the working Plan has to be carried out, a period of nearly 5 years is required to remove the 100 tons, I have to state that the estimate of the District Forest Officer is due to under-exploitation during the past 3 years. If dead wood is available, no green wood need be extracted.

3. No special staff is required to carry out the pro-visions of the Plan.

4. I request that early sanction of Government may be accorded to the Plan. The Superintedent, Government Press may be kindly ordered to strike off the required number of

of copies for distribution and record.

I have the honour to be,
Sir,
Your most obedient servant,

Sd./S.V.Ammiengar,

Conservator of Forests.

Copy.

13/6-12-24 For Conservator of Forests.

Copy of letter No.992 dated 12th June 1924, from the District Forest Officer, Mysore, to the Conservator of Forests in Mysore.

****

Adverting to your No.334 dated the 10th July 23, I have the honour to resubmit herewith, the manuscript copy of the Sandal working Plan report of the Chamarajanagar Taluk and to state as follows.-

2. Owing to the Khedda Operations and other important Forest works, I was not able, until the latter part of the last month, to inspect the areas covered by the Working Plan Report and hence the delay in its submission.

3. The report provides for a yield of 22 tons 6 cwts., 110 lbs., and 10 ozs., of rough prepared wood, of which, 7 tons 45 lbs and 14 ozs., come from mature healthy trees, and the rest from dead and dying trees. From my own observations during my recent tour in the Chamarajanagar Taluk, I find that according to a very modest estimate, about 100 tons of utilizable dead wood could immediately be collected. If exploitation according to the Working Plan has to be carried out, a period of nearly 5 years is required to remove the 100 tons. This, obviously cannot be done, for the dead wood should be collected as soon as possible.

4. The report contemplates the appointment of a special staff which is absolutely necessary to carry out the provisions of the Plan..

Under the present condition, protection of sandal outside

SANDAL WORKING PLAN REPORT OF THE CHAMRAJNAGAR TALUK.

INTRODUCTION.

The field work was commenced in the middle of February 1922 and completed before the end of October 1922.

Three trained Rangers, assisted by one recorder and one enumerator, were employed on field work throughout. These Rangers, Messrs. C. Rama Rao, V. Rangachar and T. Y. Basavasetty were all transferred on the completion of the work at the end of October 1922. The writer of the report was in charge of the valuation Survey operation throughout, except for about two months in the beginning.

The cost incurred for the work in this taluk is noted below.

		Rs.	a.	p.
1.	Pay and T. A. of the Officer	2,149	8	0
2.	Do Subordinates	4,270	7	0
3.	Working charges	2,232	9	0
	Total	8,652	8	0

This works out to an average of (5¼ pies) per acre.

PART I.

SUMMARY OF FACTS ON WHICH THE PROPOSALS ARE BASED.

CHAPTER I.

DESCRIPTION OF THE TRACT DEALT WITH.

1. The report deals with the whole of the Chamrajnagar Taluk which included two ranges which were recently formed into one range only.

2. The taluk is hilly along its eastern border. The highly wooded region adjoining the Nilgiri Range is in the south-east corner of the taluk in a compact block. The drainage is towards the north generally. The rest of the taluk is cultivated land with bare undulating pasture ground, forming gomals and wastes.

3. *Underlying rock and soil.*—Resting on the low lying fertile tract of the country drained by the Suvarnavati are the massive chamoekite of which the rock is composed. The soil on the plains is dry and gravelly.

4. The tract being situated between the Eastern and two Western Ghats is exposed to both the N. E. and S. W. monsoons. The Rainfall is heaviest in the south-west, diminishing towards north and west.

CHAPTER II.

1. *Distribution and area.*—The total area included in the plan is 475 square miles, including 63,163 acres of State Forest area.

2. *Legal position.*—Sandal being a royal tree is exclusively the property of the Government. With regard to trees grown in private holdings, a bonus, depending on the size of the tree is paid to the owner of the holding on removal of such tree. In Palace kavals and Yelandur and Sringeri Matt Jahagirs, all the sandal trees belong to the owners entirely.

3. *Composition and condition of the crop.*—Sandal seems exceedingly scattered, in cultivated land, gomal, State Forest, etc. Necessarily, the composition is mixed and varied. It rarely occurs pure.

Injuries to which the crop is liable.—The bark being very thin, this species is very susceptible to fire damage; and from the nature of its distribution, no organised scheme of fire protection is at once possible. The bark on young stems being particularly thin, it suffers from sunscorching in the absence of nurses. Injuries from lopping for goat fodder are very common. Owing to the vigilance of the Sandal Survey party, damage was not frequent in the working areas and a few cases of damage were severely dealt with by the taluk authorities. Spike disease is prevalent in areas stocked with young plants and trees of 9"—18" girth. Of all the taluks of the district, probably this taluk is the least affected by spike, barring Gundlupet. The disease was first noticed between 1900-04 in gregarious patches and has since spread only slowly.

CHAPTER III.

1. *System of Management.*—The only system hitherto adopted was the removal of dead trees. The collection was originally conducted departmentally, and later on, through contractors.

2. *Works of improvement.*—Sowing seeds in sandal uprooted areas and in prepared patches, in the vicinity of suitable thorny hosts is the usual rule. Besides, in the year's coupe, sandal seeds are dibbled in, along with those of Teak, Beete and Honne. The cost of dibbling sandal seeds at present admitted, is as low as Rs. 10

per 100 acres. The average quantity of seed used, comes to about ½ seer per acre or about 400 seeds. This operation has to be entirely carried on by the Range Officer himself, in addition to his other duties during the sowing season. It is difficult, both to conduct the operation with necessary care and to satisfactorily check the work so carried out. Regular pits 1' square and 9" deep should be made for sowing and left exposed to the air, at least, a fortnight prior to sowing, to evade rodents. It is learnt from the villagers of Santhemarahally Hobli, that some twenty years ago, sandal seeds were distributed to them by the Amildar for sowing anywhere and everywhere. It is even reported that some seedlings were watered and carefully reared.

Now, of course, there are few trees surviving. As a measure of improvement, the same plan may again be tried, though it does not tend to concentrated working.

CHAPTER IV

Utilization of produce.—The wood is rough-prepared in the jungle and despatched to kottes for further preparation and sorting into classes, before being sold. Bombay merchants were the chief customers, prior to the starting of the Sandal Oil Factory, which now consumes the produce.

The maximum quantity of sandal wood supplied in one year from this taluk was about 50 tons in 1918-19, for both the ranges.

CHAPTER V

There is no special Sandal staff at present. All the works of protection, propagation and tending and extraction are attended to by the Range officer and subordinates, in addition to their other equally important duties. Besides, in most cases, the headquarters and the chief working centres of ranges are unfavourably situated with regard to some gomal and other valuable sandal tracts which therefore receive less than ordinary care and protection. To avoid this, a special sandal staff with headquarters close to well-stocked sandal areas, must be formed and fire-protection and lopping and other damage to the species must be keenly attended to for some years in the beginning, directing more and more energy to propagation and tending, with increasing organisation.

As the species is very irregular in distribution, occurring pure nowhere, and in admixture with all kinds of species, garden species and annual crops, special attention must be paid to the formation of reserves of suitable well-stocked sandal tracts of sufficient extent. The first and essential step is rigidly to fire-protect such reserves and reduce damage by the hand of man to a minimum. When this is done, filling up blanks by means of sowings in pits and patches, is easy, even though grazing be not entirely restricted. Acquisition of other suitable areas year by year or periodically, must be strictly in proportion to the increase of the special staff.

From careful perambulations, it is found that nearly all gomal lands of a large number of villages in the Chandakavadi Hobli are well stocked sandal areas, though in one or two cases, such areas are ravaged by spike more than 80 per cent. Intensive culture of sandal in these heavily stocked areas as a garden species will repay cost with compound interest. When a start is made, it ought to be easy to manage gomals with the fullest sympathy of the villagers.

PART II.

FUTURE MANAGEMENT DISCUSSED AND PROPOSED BASIS OF PROPOSALS.

CHAPTER VI.

Working circles how composed and reasons for their formation.—The whole taluk has been divided into two working circles, *viz.*, Chandakavadi and Harve working circles. Chandakavadi working circle consisting of Chandakavadi and Chamrajnagar blocks, is the chief sandal area of the taluk, extending from the eastern boundary of the taluk westwards to the Suvarnavati River.

From considerations of economic working, Chamrajnagar and Chandakavadi blocks are fixed to be the only felling series to be regularly exploited. The two other blocks of the taluk do not lend themselves to systematic exploitation, through poverty of stock. Of course, works of improvement, consistent with the staff that may be provided therefor, may be carried on in these blocks, but it would be futile to take the whole area in question at once for such works.

The following table shows the names of working circles and felling series and blocks with their respective areas:—

Working circle	Felling series and Blocks	Number of villages	St. Fts.	Area of villages in acres		Area of State Forest
				Cultivation	Non-cultivation	
I. Chandakavadi	(a) Chandakavadi...	32	1	25,529	12,163	63,042 acres
	(b) Chamrajnagar...	57	...	33,214	38,478	...
II. Harve	...	44	....	40,646	12,813	...
Ummattur	...	38	...	36,731	14,246	...
Consisting of Ummattur and Harve blocks.	...	...	...	...	...	...

DIVISION OF THE AREA FOR PURPOSES OF ENUMERATION.

As regards Revenue lands, each village Forms a unit for the purpose. The State Forest area, being very compact was enumerated in one block only.

		Number of trees
I.	Chandakavadi	1,27,316
II.	Chamrajnagar	9,342
III.	Ummattur	1,312
IV.	Harve	217

The two last are very poorly stocked and the yield is not calculated for these areas.

CHAPTER VII.

METHOD OF TREATMENT.

Objects sought to be attained.

Harve-Ummattur working circle.—In this working circle, the growth of sandal is very poor and it occurs extremely scattered. Hence, the objects sought to be attained will be:—

(1) to encourage the spread of sandal, and

(2) to improve the existing stock and introduce suitable plants in regeneration areas.

Chandakavadi working circle.—The chief objects here are—(1) the production of sustained annual yield of scented wood;

(2) the reduction of the high percentage of casualties and modification of the proportion of trees in all the girth classes;

(3) the increase of the density of sandal;

(4) the restoration of the crop to a normal condition in definite areas, chosen for special treatment.

The above objects are sought to be attained by :-

(1) Removing all dead trees of all the girth classes, as quickly as possible;

(2) Retaining sound trees to grow to maximum girths for maximum yield of scented wood;

(3) Intensive regeneration operations followed by tending, in subsequent seasons;

(4) Introduction of suitable host plants in regeneration areas.

(5) Rigid fire-protection and prohibition of damage by lopping for goat fodder.

Unfortunately, the gomals of villages are so little protected from damage by cattle and villagers, that the full benefit of host plants is not derived by sandal and it is rendered difficult to watch their effect on sandal as conditions change from time to time.

The exploitable age, however, would correspond to the age at which the mean annual increment of scented wood, would culminate. This single formula is unsafe to depend upon, as formation of scented wood is irregular, depending upon local conditions. Also such formation is precipitated by injuries and disease and generally unfavourable condition of growth. To support this view, it has been found that valuable wood is found in knots and decaying portions of immature stems, while it is absent in healthy parts. According to the results of experiments on mean annual increment, the formation of scented wood does not seem to fall off even at 54" girth. Under these conditions, it is not possible to fix rigidly exploitable girth, with any degree of accuracy. The following are some of the reasons why an absolutely accurate determination of the same is not very necessary.

1. Unlike timber, the value of scented wood does not rise with the size, small billets fetching nearly the same price as large ones, weight for weight. Hence, casualties in smaller girth classes yield nearly the same value per unit weight of prepared wood as wood in a mature tree, though the cost of preparation may be slightly higher in the latter case.

2. From the enumeration figures, it is seen, that there is a smaller proportion of trees in the higher girth classes than there ought to be, for normality. Hence, fixing the yield from exploitable girth considerations only, would diminish the yield below normal. The yield from casualties in all girth classes is as much as 40 per cent of the total, which may be treated as intermediate yield.

Method of Treatment.

Unmaltar-Harre working circle.—Owing to the poverty and scarcity of the existing stock, nothing more than the removal of dead trees in all the girth classes is necessary, together with rigid protection of the area from damage by cattle and villagers.

Chandakavade working circle.—It is proposed to work this area, under selection fellings, consistent with the nature of sandal and the objects sought to be attained.

Rate of Growth.—There is no reliable data to go on regarding this subject. Ring countings were often misleading and were noticed to vary from locality to locality, and even tree to tree. However the rate of growth observed in representative localities has been adopted here.

Number of years taken to grow to a girth of

Exploitable Age.—The highest girth to which a sandal tree reaches shows great variations. In cultivated lands, higher girths are recorded. But in some cases under similar conditions of locality, the growth in girth differs due, chiefly, to the surrounding host plants. The influence of host plants is very often sufficient to compensate for any unfavourable conditions of locality and sustain the high rate of growth, otherwise impossible in the area.

The number and variety of host plants is greater in Kharab and Gomal lands than in Forest areas.

An examination of the enumeration results, reveals the following proportion of trees in each girth class, for the whole taluk :—

IV	III	II	I		
9″—18″	18″—27″	27″—36″	36″—45″	45″—54″	54″ (over)
15·6	6·9	5·1	15·4	·99	·008
93·00%	5·94%	0·86%	0·20%		

It will be seen from the above that the percentage of trees in each girth class bears no definite proportion. Further, only 1/17 of the IV class survive to attain III class size, and 1/7 of III class survive to attain II class, and ¼ of II class survive to attain I class size. Hence, it can be inferred that a very large proportion of IV class trees die out, due to spike and other causes, confirming the view that spike disease gets hold of very young trees and kills them within 20 years, the longest, before they attain any size. Such of them as survive or avoid spike disease do survive to maturity. The percentage of casualties is lower in higer girth classes. The exploitable girth may be fixed at 36″, so as to be sure of maturity, and at the same time, to avoid decay setting in by raising the girth of exploitability any further.

CHAPTER VIII.

Fellings —From the result of ring countings, generally in the Mysore District, and especially in Chamrajnagar Taluk, the time required for one girth class tree to pass into the next higher girth class is about 20 years (refer to table under Rate of growth, Chapter VII). Allowing a margin of 5 years for errors and insufficient investigation, the above period may be raised to 25 years. Besides, it is desirable to have the felling rotation as long as possible, to ensure that the area worked over each year is not unmanageably big. For both the above reasons, the felling cycle is fixed at 25 years.

From Table A appended of healthy trees, in the various girth classes, the actual survivals may be assumed to be in the following proportion for each girth class :—

Class I	90%
Class II	80%
Class III	65%
Class IV	40%

Since 36″ has been fixed to be the exploitable size, all the trees in the first class are either just mature or over-mature; and in the 2nd class, some are mature and the rest become mature during the 1st felling cycle, while in the 3rd class, 1/10 may be reckoned upon as becoming mature in the same period. Hence, we have the following healthy mature stock, to get the annual yield out of :—

B.	Chamrajnagar	Number already mature	146
		Number becoming mature in 25 years ..	353
A	Chandakavadi	Number already mature	142
		Number becoming mature in 25 years ..	862

Since the number of trees which attain exploitable dimensions in a given period represent the possibility of the crop for the period, the annual yield works out to the *number of II and III* class trees attaining exploitable size during the period of the felling cycle.

Hence, the annual yield in number of trees in the several felling series is as below :—

Chamrajnagar .. .. .. $\frac{343}{25}$ = 14 trees.

Chandakavadi .. .. .. $\frac{862}{25}$ = 34 trees

But since the fellings are not spread over the whole area each year, but only on $\frac{1}{25}$ of the area, there must be present on the ground, the following number of mature trees representing sufficient stock at the end of the first felling cycle and thereafter :—

B. Chamrajnagar :

On the area felled over 1 year ago there must be on the ground $\frac{1}{25} \times$ trees.

And on the area felled over 2 years ago there must be on the ground $\frac{1}{25} \times 2$ trees and so on

Do. 25 years ago do. $\frac{1}{25} \times 25$ trees.

A. Chandakavadi : Similarly $\frac{1}{25} \times$ trees for each series.

Therefore the normal stock available in each felling series is ascertained thus :—

B. Chamrajnagar :

Normal stock = $\frac{343}{25} \times 1 + 2 + 3 \ldots \ldots 25$ trees

$= 14 \left(\frac{25 \times 26}{2}\right)$ trees.

$= 14 \times 325 = 4550$ trees.

A. Chandakavadi :

Normal stock = $\frac{862}{25} \times 1 + 2 + 3 \ldots \ldots 25$ trees

$= 34 \left(\frac{25 \times 26}{2}\right)$ trees.

$= 34 \times 325 = 11050$ trees.

	Normal stock	Actual stock	Deficit
	trees	trees	
B.	4550	4552	3*
A.	11050	11052	300

As there is deficit stock, the exploitation must be limited to the figures given below, in the first felling cycle :—

B. Chamrajnagar :

Stock to be exploited = 4552 − 4550 = 3.7 trees

A. Chandakavadi :

Stock to be exploited = 862 − 300 = 562 trees.

Hence, annual yield works out to :—

In B $\frac{37}{25}$ = 13 trees

In A $\frac{562}{25}$ = 23 trees

Deficit in B = 4550 − 4552 = 3 trees. Deficit in A = 11050 − 11052 = 300 trees.

In B = 13 trees. Deficit = 3 trees. Total to be exploited = 16 trees.

In A = 23 trees. Deficit = 300 trees. Total to be exploited = 323 trees.

(While dealing with fractions, more than $\frac{1}{2}$ is taken to be one and less than $\frac{1}{2}$ is ignored.)

Adding 25% for girth deficiency (i.e., 4 trees 3 trees = 1 tree), the yield in terms of second class works out to 20 trees (16 + 4) in B and 404 (323 + 81) in A.

The following is a forecast of the crop at the end of the 1st felling rotation :—

A. Chandakavadi :

Stock at the end of 1st felling cycle	Stock to be left	Stock to be felled
1 year old	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
Total	300	562
		Deficit 300
		Total 862

Similarly for Chamrajnagar felling series, Stock for the 2nd felling cycle is as follows.—

I 173 trees.
II 1,146 ,,
III 4,730 ,,
IV Sufficient stock out of regeneration.

.....	.....	Trees	Annual yield during the 2nd felling cycle.
B. Chamrajnagar ..	No. already mature	284	$\frac{1,054}{25}$ = 42 trees
	No. becoming mature in 25 years ..	1,054	
A. Chandakavadi ..	No. already mature	685	$\frac{4,292}{25}$ = 172 trees
	No. becoming mature in 25 years ..	4,292	

A comparison between the yield in the first and second felling cycles shows an improvement to the extent of $3\frac{1}{2}$ times in the case of Chamrajnagar and eight times in the case of Chandakavadi, thus justifying the proposals of the plan.

We have next to consider the yield from (1) the standing dead stock and (2) dying stock. The annual yield from this stock is 1/25th of the whole stock on the ground. The corresponding yield of scented wood is calculated for each girth-class of both the felling series. The total yield for the Taluk works out to tons 12, cwts. 2, lbs. 34 as detailed in table B appended.

The average of five years of koti figures show that 100 tons of rough prepared wood are equivalent to 79 tons of cleaned wood. On this assumption, the yield in terms of rough-prepared wood from (*a*) Healthy and (*b*) Dead and dying stock is tablulated below.—

Name of felling series (Blocks)	Yield of rough-prepared wood from mature healthy trees				Yield of rough-prepared wood from dead and dying trees				Total			
	tons	cwts.	lbs.	oz.	tons	cwts.	lbs.	oz.	tons	cwts.	lbs.	oz.
B. Chamarajnagar ..	2	11	27	12	0	3	47	0	2	14	74	12
A. Chandakavadi ..	4	9	18	2	15	3	7	12	19	12	25	14
Total ..	7	0	45	14	15	6	54	12	22	6	100	10

	tons	cwts.	lbs.	oz.
Ground-hidden roots from all the blocks may be estimated to yield	0	13	11	6

Therefore the total yield of rough-prepared wood for the whole of the Taluk works out to 23 tons.

PERIOD FOR WHICH FELLINGS ARE PRESCRIBED.

The period of fellings is 25 years from July 1924.

ORDER AND ARRANGEMENT OF FELLINGS.

Owing to the wide and indefinite distribution of sandal, it is not possible to lay down where the crop is oldest requiring immediate exploitation. However, one twenty-fifth of the total area of the block should be marked out each year for fellings. If the prescribed yield is not available in the area, the following year's coupe may be marked and fellings commenced to make up the yield, and the working continued in the same area next year and so on. The yield in terms of rough-prepared wood from mature healthy stock and from dead and dying trees is given above.

MODE OF EXECUTION FELLINGS.

(a) Healthy trees—1. The area of the year's operation being fixed at 1/25th of the felling series, may, when necessary, be specified by a certain number of villages or portions of villages.

2. The selection and marking must be carried out in April and May each year, by the marking officer, under the supervision of the controlling officer, after an enumeration conducted over the area for healthy mature trees. The marked trees should be in three classes

(1) Roots and stumps.
(2) Dead and dying trees, and
(3) Trees of 36" girth and over (healthy).

Coupe registers must be maintained, showing the area of the coupe and its estimated yield with a report after the fellings.

3. Trees in occupied lands must be first marked and other areas taken up later.

4. In selecting healthy trees for removal, their maturity as indicated by the appearance of the heartwood within 2" of the surface of the bark, must be the prime consideration, together with indications of unsoundness and signs of damage by fire, etc.

5. Marking should be done with the 'F' hammer, each tree bearing the mark distinctly on carefully blazed parts, together with the serial number of the tree, both of which must be left in relief while rough dressing.

6. Solitary mature trees, unless dead or dying or decaying, should be preserved as seed sources, unless there is sufficient stock of regeneration to take their place.

(b) Dead and dying trees—In the annual coupe, all dead trees should be first felled and sufficient dying trees also to make up the yield from this class of trees. Of the dying class, those affected by spike or trees broken down or fallen, and all such trees as are attacked by epiphytes must be marked for removal before others. It is preferable to fell all dead and dying trees in the year's coupe, irrespective of the yield fixed for the class and the total annual yield, even healthy trees made up by felling sufficient healthy mature trees.

Fire Protection—Owing to the wide and scattered distribution of sandal, no successful scheme of fire protection of all the areas, at once, can be formulated. Sandal Reserves, State Forests and plantations will, of course, be protected annually. Gomal areas within the jurisdiction of beat guards must be managed with the sympathetic help of the villagers, and by admitting rights of grazing and cutting dry fuel.

Cultural operations. The present practice of sowing and dibbling over vast areas at small costs, is not, in any way, beneficial, as the work cannot be carried out with the necessary care to ensure successful results, nor can the work be checked completely by inspecting officers. As it is, no works of weeding and tending are carried out, both on account of the vastness of the area and on account of want of funds. The following scheme, as already suggested may, however, be tried.

Sowings in pits one-foot square and 9" deep, a fortnight after the pits are ready, under the shade of or in the vicinity of suitable thorny host plants, may be provided for and enforced. An increased rate of Rs. 1-8-0 or Rs. 2 may be allowed per acre of 75 pits. This cost is worth incurring, seeing the importance of this species. Seeds for sowing must be obtained from healthy sandal trees from the Shimoga District. When seeds are sown in pits near thorny plants, a branch or two of the host may be cut half through and bent over the patch to prevent cattle trampling down the seed and to protect the seedling from being grazed. When this precaution is taken, grazing need not be restricted. In fact, grazing would certainly be good, by keeping down rank growth of grass, thereby preventing excess of fire-damage in cases of fire.

Rigid fire protection over small areas must be attended to, say, to an extent of 100 acres per ranger or 10 to 15 acres per guard of each range.

In conducting fellings for timber and fuel, care must be taken to reserve host plants and nurses of healthy sandal trees. Climber-cutting must be carried out, though thereby one or two hosts of sandal are removed. It is very rarely that climbers alone will act as hosts. But the harm done by climbers, by turning round stems and hanging down like a dead weight on the crowns of trees, is sufficiently great to warrant their removal in all cases.

An adequate staff set apart for sandal work will obviate much of the difficulty, at present felt, and will facilitate protection and tending of regeneration, and will remove altogether the chances of damage to sandal by villagers.

Financial Results.

Receipts.--The yield of 17 tons, 13 cwts. of cleaned wood valued at Rs. 1,200 per ton, fetches Rs. 21,185.

Expenditure.--The cost of collection, preparation and carting to koti and cleaning and classifying at the koti calculated at Rs. 50 per ton—

	Rs.
Works out to	880
Sowing and dibbling	1,500
Special protective staff....	1,500
Tools required	500
Total	4,380

Net surplus will be Rs. (21,185--4,380), or Rs. 16,805.

The enumeration results of this taluk show that the stock of sandal trees consists mostly of trees of 9″, 18″ girth class, indicating that, with proper protection, the yield in future years will rise rapidly. As compared with the Gundlupet Taluk, the density in this taluk of sandal in sandal areas, is about $\frac{2}{3}$ of that of the sandal areas in the Gundlupet Taluk. Death due to spike disease is equally heavy in both the taluks.

D. NARASIMHAMURTY ROW,
Sub-Assistant Conservator,
Sandal Valuation Survey,
Kadur Section,
Camp Birur.

G.R.S. VI G 34]

SUBJECT.....

.....

.....

Diary No. of letter replied to.....

General and Revenue Secretariat

( )

, *the* 192 .

Date of issue.....

Signed by.....

and stating that no special staff is required to carry out the proposal ~~forwarding~~

May this be

i Printed ?

ii treated as a standing order ?

iii published in the Gazette, English Part ?

iv translated ?

v placed at the disposal of the press ?

vi published in the Gazette, Kannada Part ?

Section

File No. 19 - 24

Serial No. 2

Proceedings of the Government of His Highness the Maharaja of Mysore

Read— Letter no. 35 dated the 15th July 1924 from the Conservator of forests in Mysore submitting for ~~sanction~~ with the opinion of the D.F.O. Hassan the Sandal working Plan Report of the Channarayanapatna Taluk drawn up by Mr. D. Narasimha Murthy Ras. S.A.P. of forests ~~together with~~ a copy of letter no. 9492/24-25 dated 10th June 1924 from the D.F.O. Mysore Officiating ~~his remarks thereon~~.

Order Thereon No. F.C. 1633-4 -

(Subject to Divisional) Report the working plan is approved except the remarks that ~~the~~ 100 tons of utilisable dead wood is available as reported by the D.F.O. it is necessary that ~~the~~

G. R. S. VI—G/32]

SUBJECT.....

.....

.....

Diary No. of letter replied to——————

Section.

File No.

Serial No.

General and Revenue Secretariat

( )

, *the* *192* .

No.

Date of issue ——————

Signed by——————

To The Conservator of Forests

Sir,

With reference to your letter No. 35 02 16] 24 requesting approval to the Sandal a working plan report of the Lekkavaragapa Taluk, I am directed to observe that the working plan does not give the past Revenue & Expenditure

over.

so as to enable a comparison with the estimated yield. The yield for a number of years is unsatisfactory

2. The large difference between the estimated yield of the E.P.C.O & the actual yield in the working plan, is said to be due to under-exploitation in the forest during 3 years. If this was the correct reason, why was not this done earlier?

3. It may also be explained as to what action is proposed to be taken to remove the deficiency?

4. The marginal remarks on the report does not appear to have been answered.

5. The report is herewith sent for needful being done and returned to have etc

List of enclosures.

Copied by
Examined by
A.D.F.O. [illegible]

26.7.24 For Rev. Secy